

CLAIMS

What is claimed is:

1. A solenoid fluid control valve, comprising:

a fluid control body adapted for being received in a fluid housing, said fluid control body including a central cavity, and having a pressure supply passage at a first end and a radially extending pressure control passage;

a feed supply tube positioned in said central cavity, said feed supply tube including an outer diameter in communication with said pressure control passage, and including an inner bore operably connected to said pressure supply passage, said feed supply tube being supported in said central cavity of said fluid control body by at least one flying buttress structure interposed therebetween, said feed supply tube including a valve receiving chamber area;

a valve seat portion being made of a plastic material and press fit onto said control body, said valve seat portion including a valve seat and a passage in communication between said valve seat and said pressure control passage;

a valve contained in said valve receiving chamber area for closing off communication between said pressure supply passage and said pressure control passage; and

a solenoid for opening said valve in response to a signal.

2. The invention according to claim 1, wherein said solenoid includes a central axis and has a coil wound around a bobbin, spaced from and positioned around said central axis, said coil having radially stepped radial inner diameters.

3. The invention according to claim 2, further comprising a casing member for attaching said solenoid to said control body, a portion of said casing member extending into the stepped portion of said coil for forming a flux tube therein, said bobbin including a "C" shaped integrally molded retention ring.
4. The invention according to claim 3, further comprising an armature axially movable within said bobbin.
5. The invention according to claim 4, wherein said armature includes at least one area defining a pressure relief vent formed thereon.
6. The invention according to claim 4, further comprising a pole piece adjacent said armature interposed between said bobbin and said fluid control body.
7. The invention according to claim 6, further comprising a control rod extending along said central axis and through said pole piece for opening of said valve.
8. The invention according to claim 6, wherein at least one tolerance of said valve seat portion is maintained such that the distance between said valve seat

and the upper surfaces of at least one wing member adjacent said pole piece is maintained within a tolerance of  $\pm 0.025$  mm.

9. The invention according to claim 1, wherein said solenoid fluid control valve is a ball valve.

10. A solenoid fluid control valve, comprising:

a fluid control body adapted for being received in a fluid housing, said fluid control body including a central cavity, and having a pressure supply passage at a first end and a radially extending pressure control passage;

a feed supply tube positioned in said central cavity, said feed supply tube including an outer diameter in communication with said pressure control passage, and including an inner bore operably connected to said pressure supply passage, said feed supply tube being supported in said central cavity of said control body by at least one flying buttress structure interposed therebetween, said feed supply tube including a valve receiving chamber area;

a valve seat portion being made of a plastic material and press fit onto said control body, said valve seat portion including a valve seat and a passage in communication between said valve seat and said pressure control passage;

a valve contained in said valve receiving chamber for closing off communication between said pressure supply passage and said pressure control passage;

a solenoid for opening said valve in response to a signal, said solenoid including a central axis and having a coil wound around a bobbin, spaced from and positioned around said central axis, said coil having radially stepped radial inner diameters;

a casing member for attaching said solenoid to said control body; a portion of said casing member extending into the stepped portion of said coil for forming a flux tube therein, said bobbin including a "C" shaped integrally molded retention ring; and

an armature axially movable within said bobbin.

11. The invention according to claim 10, wherein said armature includes at least one area defining a pressure relief vent formed thereon.

12. The invention according to claim 10, further comprising a pole piece adjacent said armature and interposed between said bobbin and said fluid control body.

13. The invention according to claim 12, further comprising a control rod extending along said central axis and through said pole piece for opening of said valve.

14. The invention according to claim 10, wherein at least one tolerance of said valve seat portion is maintained such that the distance between said valve seat

and the upper surfaces of at least one wing member adjacent said pole piece is maintained within a tolerance of  $\pm 0.025$  mm.

15. The invention according to claim 10, wherein said solenoid fluid control valve is a ball valve.

16. A solenoid fluid control valve, comprising:

a fluid control body adapted for being received in a fluid housing, said fluid control body including a central cavity, and having a pressure supply passage at a first end and a radially extending pressure control passage;

a feed supply tube positioned in said central cavity, said feed supply tube including an outer diameter in communication with said pressure control passage, and including an inner bore operably connected to said pressure supply passage, said feed supply tube including a valve receiving area;

a valve seat portion being made of a plastic material and press fit onto said control body, said valve seat portion including a valve seat and a passage in communication between said valve seat and said pressure control passage;

a valve contained in said valve receiving chamber for closing off communication between said pressure supply passage and said pressure control passage;

a solenoid for opening said valve in response to a signal, said solenoid including a central axis and having a coil wound around a bobbin, spaced from

and positioned around said central axis, said coil having radially stepped radial inner diameters;

a casing member for attaching said solenoid to said control body;

a pole piece adjacent said armature and interposed between said bobbin and said fluid control body;

a flux tube secured by said casing member, said flux tube including a support portion extending therefrom; and

an armature axially movable within said bobbin.

17. The invention according to claim 16, wherein said armature includes at least one area defining a pressure relief vent formed thereon.

18. The invention according to claim 16, wherein said armature includes an axially extending rod portion extending from said armature into said support.

19. The invention according to claim 18, further comprising a bearing secured in said support wherein said rod portion slidingly extends through said bearing portion, said bearing stabilizing the movement of said armature.

20. The invention according to claim 16, wherein at least one tolerance of said valve seat portion is maintained such that the distance between said valve seat and the upper surfaces of at least one wing member adjacent said pole piece is maintained within a tolerance of  $\pm 0.025$  mm.

21. The invention according to claim 16, wherein said solenoid fluid control valve is a ball valve.